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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/729,694	12/06/2000	Gang Yang	57042-024	6844

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EXAMINER	
PATHAK, SUDHANSHU C	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 04/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/729,694	YANG ET AL.	
	Examiner	Art Unit	
	Sudhanshu C. Pathak	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *April 12th, 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16,18,19,26 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16,18,19,26 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *March 26th, 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. In view of the Petition for "Exercise of Supervisory Authority and Withdrawal of Premature Finality of Office Action" filed on April 12th, 2005, the **Petition is Granted and PROSECUTION IS HEREBY REOPENED.**

2. Claims 16, 18-19, 26 & 27 are pending in the application.

3. Claims 1-15, 17 & 20-25 & 28-29 have been canceled.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 16, 18-19 & 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webb et al. (4,485,486) in view of Schulz (6,611,511) in further view of Shen et al. (5,952,963).

Regarding to Claim 16, Webb discloses performing a hand-off of a mobile station in a cellular system that includes a smart antenna system of plural sector antennas (Abstract, lines 1-4, 19-27 & Fig. 1-2 & Column 1, lines 25-40 & Column 4, lines 48-62) comprising recording signal strengths received at one or more of the plural sector antennas from the mobile station (Abstract, lines 19-27 & Column 5, lines 9-13); monitoring the signal strength changes (degradations) from the recorded signal strengths (Abstract, lines 19-27, Column 2, lines 57-68 & Column 5, lines 9-20 & Fig. 3a, elements 402-418 & Column 8, lines 12-68); assessing the movement of the

mobile station based on the monitored signal strengths (Column 5, lines 9-44 & Fig. 3a-d & Column 2, lines 57-68); determining when the signal strength received at one antenna from the mobile station reach a pre-determined threshold and further performing hand-off of the mobile station when reaching of a predetermined threshold is so determined (Fig. 3a-d & Column 2, lines 57-68 & Column 5, lines 9-44 & Column 8, lines 12-68). Webb further discloses hand-off comprising a hand-off between two different sector antennas serving two different sectors and a hand-off between two different two adjacent cells (Abstract, lines 19-27 & Column 5, lines 9-23). However, Webb does not explicitly disclose selecting the hand-off controlled in response to the assessment of the movement of the mobile station based on the calculated rates of signal changes.

Schulz discloses selecting hand-off by the mobile station by assessing the movement of the mobile station (Column 3, lines 30-50, 61-67 & Column 4, lines 1-21 & Fig. 1). Schulz further discloses implementing the system in a CDMA (spread spectrum) cellular system (Fig. 3 & Column 7, lines 10-23 & Column 1, lines 35-67 & Column 2, lines 1-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schultz teaches selecting hand-off based on the assessment of the movement of the mobile station and this can be implemented as a criterion for hand-off in any cellular communication system. Furthermore, hand-off is inherently based on the assessment of the movement of the mobile station in any cellular communication system, as the mobile station moves from a different sector or to a different cell and the assessment is based on

measuring various system parameters. However, Webb in view of Schulz does not explicitly disclose controlling the hand-off based on the calculated rates of signal changes.

Shen discloses a method and apparatus for selecting an antenna from a diversity of antenna in a wireless communication system (Abstract, lines 1-2 & Column 1, lines 15-35). Shen also discloses implementing the antenna selection based on the received signal strength indicator (RSSI) (Column 2, lines 22-36 & Column 4, lines 25-42). Shen further discloses implementing the selection criteria based on the gradient error vector wherein the vector represents the magnitude of the received signals rate of change (Abstract, lines 25-28 & Column 4, lines 9-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Shen teaches implementing a selection criteria for selecting an antenna based on the rate of signal changes and this can be implemented in the system as described in Webb in view of Schulz so as to initiate hand-off before the signal quality declines and avoid complete loss of communication.

Regarding to Claim 18, Webb in view of Schulz in further view of Shen discloses a method for performing hand-off of a mobile station in a cellular system wherein selecting handoff, comprising selecting between two different sector antennas or a between two adjacent cells or between two different sector antennas, is controlled in response to the assessment of the movement of the mobile station based on the calculated rates of signal changes as described above. Webb further discloses assessing the movement includes determining if the rate of change is indicative of

tangential motion across an antenna sector or is indicative of radial motion within an antenna sector (Abstract, lines 19-27 & Column 5, lines 9-23).

Regarding to Claim 19, Webb in view of Schulz in further view of Shen discloses a method for performing hand-off of a mobile station in a cellular system wherein selecting handoff, comprising selecting between two different sector antennas or a between two adjacent cells or between two different sector antennas, is controlled in response to the assessment of the movement of the mobile station based on the calculated rates of signal changes as described above. Webb further discloses a step of determining when the signal strength reaches a predetermined threshold comprising determining when signal strength received at an antenna from the mobile station reach a first predetermined threshold (Fig. 3d, elements 474 & Column 5, lines 9-44 & Column 12, lines 50-65 & Column 13, lines 3-14).

Regarding to Claim 26, Webb discloses a computer readable medium (Fig. 2, elements 358, 362-366, 352-356 & Column 5, lines 45-68 & Column 6, lines 3-19) bearing instructions for controlling plural sector antennas of a smart antenna system (Fig. 3a-d & Fig. 4 & Column 8, lines 12-49) wherein said instructions being arranged to cause one or more processors upon execution to perform steps comprising recording signal strengths received at one or more of the plural sector antennas from the mobile station (Abstract, lines 19-27 & Column 5, lines 9-13); calculating the rates of signal changes from the recorded signal strengths (Abstract, lines 19-27, Column 2, lines 57-68 & Column 5, lines 9-20 & Fig. 3a, elements 402-418 & Column 8, lines 12-68); assessing the movement of the mobile station based

on the calculated rates (Column 5, lines 9-44 & Fig. 3a-d & Column 2, lines 57-68); determining when the signal strength received at one antenna from the mobile station reach a pre-determined threshold and further performing hand-off of the mobile station when reaching of a predetermined threshold is so determined (Fig. 3a-d & Column 2, lines 57-68 & Column 5, lines 9-44 & Column 8, lines 12-68). Webb further discloses hand-off comprising a hand-off between two different sector antennas serving two different sectors and a hand-off between two different two adjacent cells (Abstract, lines 19-27 & Column 5, lines 9-23). However, Webb does not explicitly disclose selecting the hand-off controlled in response to the assessment of the movement of the mobile station based on the calculated rates of signal changes.

Schulz discloses selecting hand-off by the mobile station by assessing the movement of the mobile station (Column 3, lines 30-50, 61-67 & Column 4, lines 1-21 & Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schultz teaches selecting hand-off based on the assessment of the movement of the mobile station and this can be implemented as a criterion for hand-off in any cellular communication system. Furthermore, hand-off is inherently based on the assessment of the movement of the mobile station in any cellular communication system, as the mobile station moves from a different sector or to a different cell and the assessment is based on measuring various system parameters. However, Webb in view of Schulz does not explicitly disclose controlling the hand-off based on the calculated rates of signal changes.

Shen discloses a method and apparatus for selecting an antenna from a diversity of antenna in a wireless communication system (Abstract, lines 1-2 & Column 1, lines 15-35). Shen also discloses implementing the antenna selection based on the received signal strength indicator (RSSI) (Column 2, lines 22-36 & Column 4, lines 25-42). Shen further discloses implementing the selection criteria based on the gradient error vector wherein the vector represents the magnitude of the received signals rate of change (Abstract, lines 25-28 & Column 4, lines 9-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Shen teaches implementing a selection criteria for selecting an antenna based on the rate of signal changes and this can be implemented in the system as described in Webb in view of Schulz so as to initiate hand-off before the signal quality declines and avoid complete loss of communication.

6. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Webb et al. (4,485,486) in view of Schulz (6,611,511) in further view of Shen et al. (5,952,963) in further view of Tayloe et al. (5,023,900).

Regarding to Claim 27, Webb discloses a computer readable medium (Fig. 2, elements 358, 362-366, 352-356 & Column 5, lines 45-68 & Column 6, lines 3-19) bearing instructions for controlling plural sector antennas of a smart antenna system (Fig. 3a-d & Fig. 4 & Column 8, lines 12-49) wherein said instructions being arranged to cause one or more processors upon execution to perform steps comprising recording signal strengths received at one or more of the plural sector antennas from the mobile station (Abstract, lines 19-27 & Column 5, lines 9-13);

calculating the rates of signal changes from the recorded signal strengths (Abstract, lines 19-27, Column 2, lines 57-68 & Column 5, lines 9-20 & Fig. 3a, elements 402-418 & Column 8, lines 12-68); assessing the movement of the mobile station based on the calculated rates (Column 5, lines 9-44 & Fig. 3a-d & Column 2, lines 57-68); determining when the signal strength received at one antenna from the mobile station reach a pre-determined threshold and further performing hand-off of the mobile station when reaching of a predetermined threshold is so determined (Fig. 3a-d & Column 2, lines 57-68 & Column 5, lines 9-44 & Column 8, lines 12-68). However, Webb does not explicitly disclose selecting the hand-off controlled in response to the assessment of the movement of the mobile station based on the calculated rates of signal changes and performing location finding of a mobile station with a cell-site signal coverage area.

Schulz discloses selecting hand-off by the mobile station by assessing the movement of the mobile station (Column 3, lines 30-50, 61-67 & Column 4, lines 1-21 & Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schultz teaches selecting hand-off based on the assessment of the movement of the mobile station and this can be implemented as a criterion for hand-off in any cellular communication system. Furthermore, hand-off is inherently based on the assessment of the movement of the mobile station in any cellular communication system, as the mobile station moves from a different sector or to a different cell and the assessment is based on measuring various system

parameters. However, Webb in view of Schulz does not explicitly disclose controlling the hand-off based on the calculated rates of signal changes.

Shen discloses a method and apparatus for selecting an antenna from a diversity of antenna in a wireless communication system (Abstract, lines 1-2 & Column 1, lines 15-35). Shen also discloses implementing the antenna selection based on the received signal strength indicator (RSSI) (Column 2, lines 22-36 & Column 4, lines 25-42). Shen further discloses implementing the selection criteria based on the gradient error vector wherein the vector represents the magnitude of the received signals rate of change (Abstract, lines 25-28 & Column 4, lines 9-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Shen teaches implementing a selection criteria for selecting an antenna based on the rate of signal changes and this can be implemented in the system as described in Webb in view of Schulz so as to initiate hand-off before the signal quality declines and avoid complete loss of communication. However, Webb in view of Schulz in further view of Shen does not disclose performing location finding of a mobile station with a cell-site signal coverage area and determining the location of the mobile station by comparing the received signal strength from at least one sector antenna against the cell-site signal coverage profile along with its predicted movement.

Tayloe discloses performing location finding of a mobile station in a cellular system that includes a cell-site signal coverage profile (Abstract, lines 1-11, 14-27 & Fig. 1 & Column 5, lines 18-35 & Column 6, lines 1-11 & Fig.'s 2-5). Tayloe also

discloses determining the location of the mobile station by comparing the received signal strength from at least one sector antenna against the cell-site signal coverage profile along with its predicted movement (Column 2, lines 38-68 & Column 4, lines 22-51 & Column 5, lines 18-35, 55-67 & Column 6, lines 1-11 & Fig.'s 2-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Tayloe teaches performing location finding of a mobile station with a cell-site signal coverage area and determining the location of the mobile station by comparing the received signal strength from at least one sector antenna against the cell-site signal coverage profile along with its predicted movement and this can be implemented in the cellular system as described in Webb in view of Schulz in further view of Shen so as to provide the system operator with the information of the mobile unit so as to optimize the coverage of the system during various heavier and or low load traffic conditions.

Response to Arguments

7. Applicant's arguments filed on April 12th, 2005 have been fully considered but they are not persuasive. Regarding to the arguments presented even though the references relate to various different wireless standards i.e. CDMA, TDMA, DECT etc. all the wireless standards perform the function of hand-off, and therefore, it would indeed be obvious to one of ordinary skill in the art at the time of the invention that the process of hand-off is essential in a wireless communication system (of any protocol or antenna configuration) to provide mobility in the communication network. Furthermore, it would be obvious to one

of ordinary skill in the art at the time of the invention that hand-off is performed based on monitoring one of various parameters of the received signal strength (any signal characteristic) such as received signal strength indicator (RSSI), signal-to-noise ratio (SNR) etc. Furthermore, Shen (5,952,963) teaches implementing the selection of antenna from a diversity of antennas, criteria based on the gradient error vector wherein the vector represents the magnitude of the received signals rate of change (Abstract, lines 25-28 & Column 4, lines 9-14), and this can be implemented in the communication system as described in Webb in view of Schulz so as to initiate hand-off before the signal quality declines and avoid complete loss of communication. Furthermore, Shen discloses a selecting between multiple antennas and Webb discloses selecting between two different serving sectors or between two adjacent cells. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that antenna diversity as described in Shen can be implemented in the communication system as described in Webb in view of Schulz so as to provide increased reliability in a noisy environment and therefore an additional selection between antennas within the same serving antenna.

Furthermore, Tayloe discloses performing location finding of a mobile station in a cellular system that includes a cell-site signal coverage profile (Abstract, lines 8-11, 14-27 & Fig. 1, element 103, 108, 113 & Column 3, lines 45-50 & Column 6, lines 29-32). Tayloe also discloses determining the location of the mobile station by comparing the received signal strength from at least one sector antenna

against the cell-site signal coverage profile along with its predicted movement (Column 2, lines 38-68 & Column 4, lines 22-51 & Column 5, lines 18-35, 55-67 & Column 6, lines 1-11 & Fig.'s 2-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Tayloe teaches performing location finding of a mobile station with a cell-site signal coverage area and determining the location of the mobile station by comparing the received signal strength from at least one sector antenna against the cell-site signal coverage profile along with its predicted movement and this can be implemented in the cellular system as described in Webb in view of Schulz in further view of Shen so as to provide the system operator with the information of the mobile unit so as to optimize the coverage of the system during various heavier and or low load traffic conditions.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

    - If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
    - The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak

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